

ABSTRACT

Systems and methods for generating three-dimensional models of an object use images having unmeasured camera parameters. Camera calibration determines the perspective of the camera from the content of the images. A background having a pattern with known marks in each image can facilitate determination of the camera parameters. One background pattern includes separated marks having rectangular sections where corners of the rectangular sections provide calibration points for the camera parameters. The camera parameters can also be determined by matching features of the object in different images and determining differences in perspective from differences in the appearance of the matched features in different images. A combination of projective and metric reconstructions provides robust reconstruction.